Analyzing Transaction Workflows in an ePrescribing System

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Abstract
Electronic Prescribing (ePrescribing) is the process of prescribing medications using an outpatient computerized physician order entry (CPOE) system that electronically exchanges prescriptions directly with the pharmacy and/or pharmacy benefits manager (PBM). Our project aims to evaluate proposed ePrescription transmission standards and a community utility for ePrescribing called the eRx Gateway for safety, quality and efficiency.

Background
The gateway is a standards-based, middleware messaging engine that acts as a single point of connect between the electronic medical record (EMR) system of the prescribers and dispensing pharmacies. The ePrescribing functional capabilities will address medication prescription, data transmission, dispensing, administration and monitoring.

Methods
ePrescribing has the potential to improve the safety, quality and cost-effectiveness of providing medication to patients. The project will use practices that already have a mature outpatient EMR and CPOE environment, but without electronic transmission of prescriptions. The study would be rolled out over several practice sites within the CareGroup Health system. The ePrescribing workflow links the prescriber with the dispenser through a network of servers. Prescribers log into the WebOMR of the CareGroup LAN, which is a comprehensive web-based ambulatory care system that includes reporting, medication ordering, lab/radiology ordering and charting. The eRx Gateway is the nodal server for ePrescription transactions. It has interfaces with third party servers, with the first one providing medication history retrieval, eligibility checking, benefits and formulary information through its connections with PBMs and Payers. The second interface takes care of the delivery of electronic prescription orders and renewal authorization requests and is connected to the Pharmacy servers for new prescriptions or refills. It is the primary gateway to route prescription transactions to retail and mail order pharmacies. The Pharmacy servers provide interface to Pharmacist or Dispenser and process requests for new Rx, modify / cancel Rx, refill requests and eligibility checks.

Outcomes
The study is expected to generate data to compare safety, quality and efficiency of prescribing in CPOE and ePrescribing. The outcomes of interest are 1) dispensing errors, 2) other medication errors, 3) formulary medication compliance, including generic substitution, 4) medical history reconciliation and 5) prescribing – dispensing efficiency. This implementation would also help in understanding the impact of ePrescribing on the efficiency of the clinic/office staff by evaluating prescription related calls and their effect on office workload and costs.

Data collection plan
The ePrescribing system will measure any deviation in dispensing from the prescription order by comparing medication orders to prescriptions using the webOMR for the CPOE order data and the databases containing prescription data. Allowances for appropriate formulary substitutions would be built into the system. To assess prescription – dispensing efficiency, the time stamps on CPOE entered orders will be compared to time stamps on the labels. A comparison would be made between the efficiency of prescribing business processes of CPOE and ePrescribing by directly observing office practices and using the office personnel to maintain their own activity logs. The logs would include call type, time spent on managing each call and frequency of calls. Within practice pre and post intervention comparisons would be made.

Conclusion
It is hoped the eRx Gateway will provide the foundation for the state of Massachusetts to rapidly implement ePrescribing services. Our study will assess the impact of ePrescribing on outpatient medication safety, as well as barriers associated with implementation.